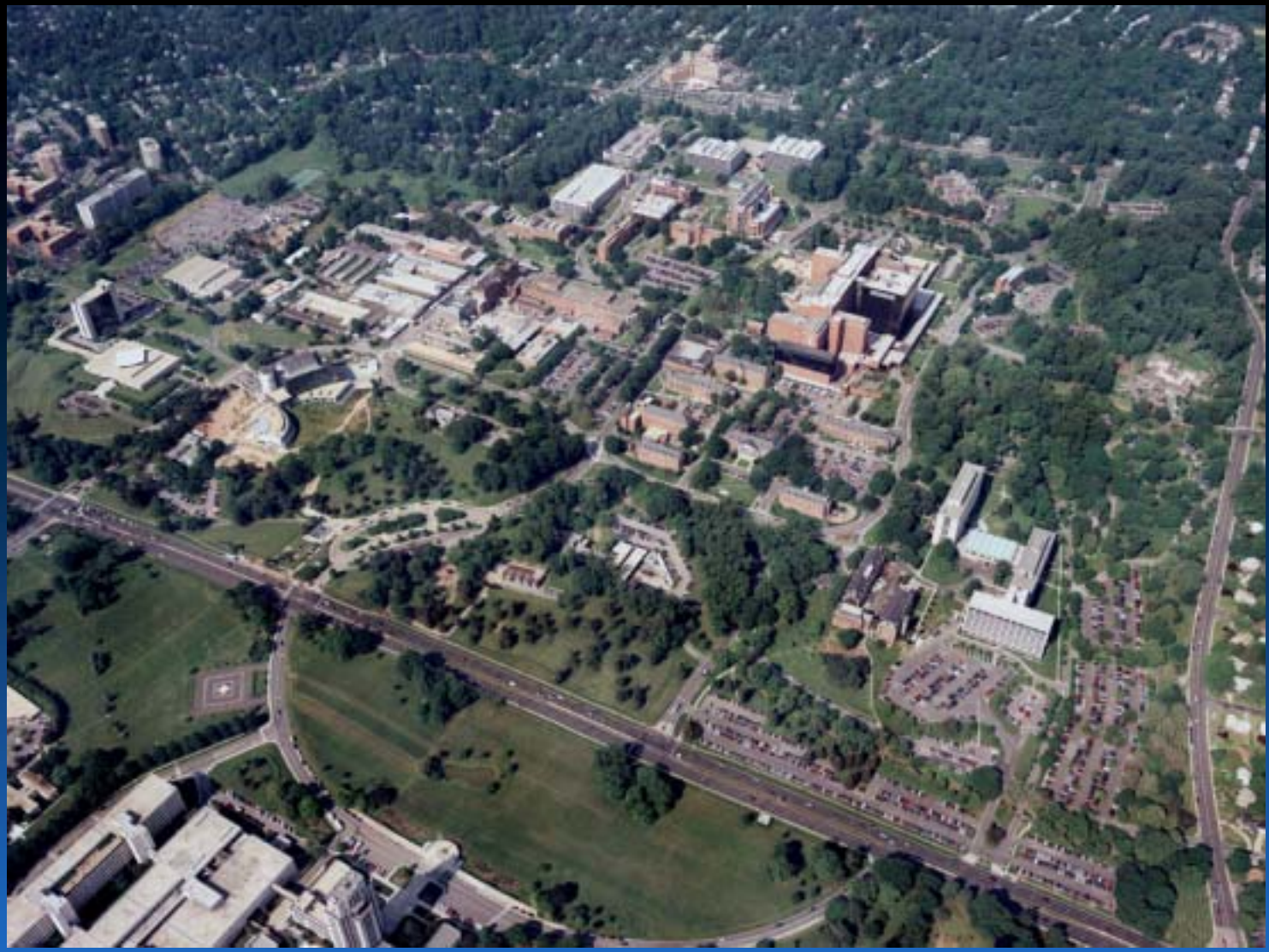
Research Training at the National Institutes of Health

NIH Office of Education, 2002
Department of Health and Human Services


NIAID
Hamilton, MT
NIA, NIDA
Baltimore, MD
NIH
Bethesda, MD
NIDDK
Phoenix, AZ
NIEHS
Raleigh/Durham, NC

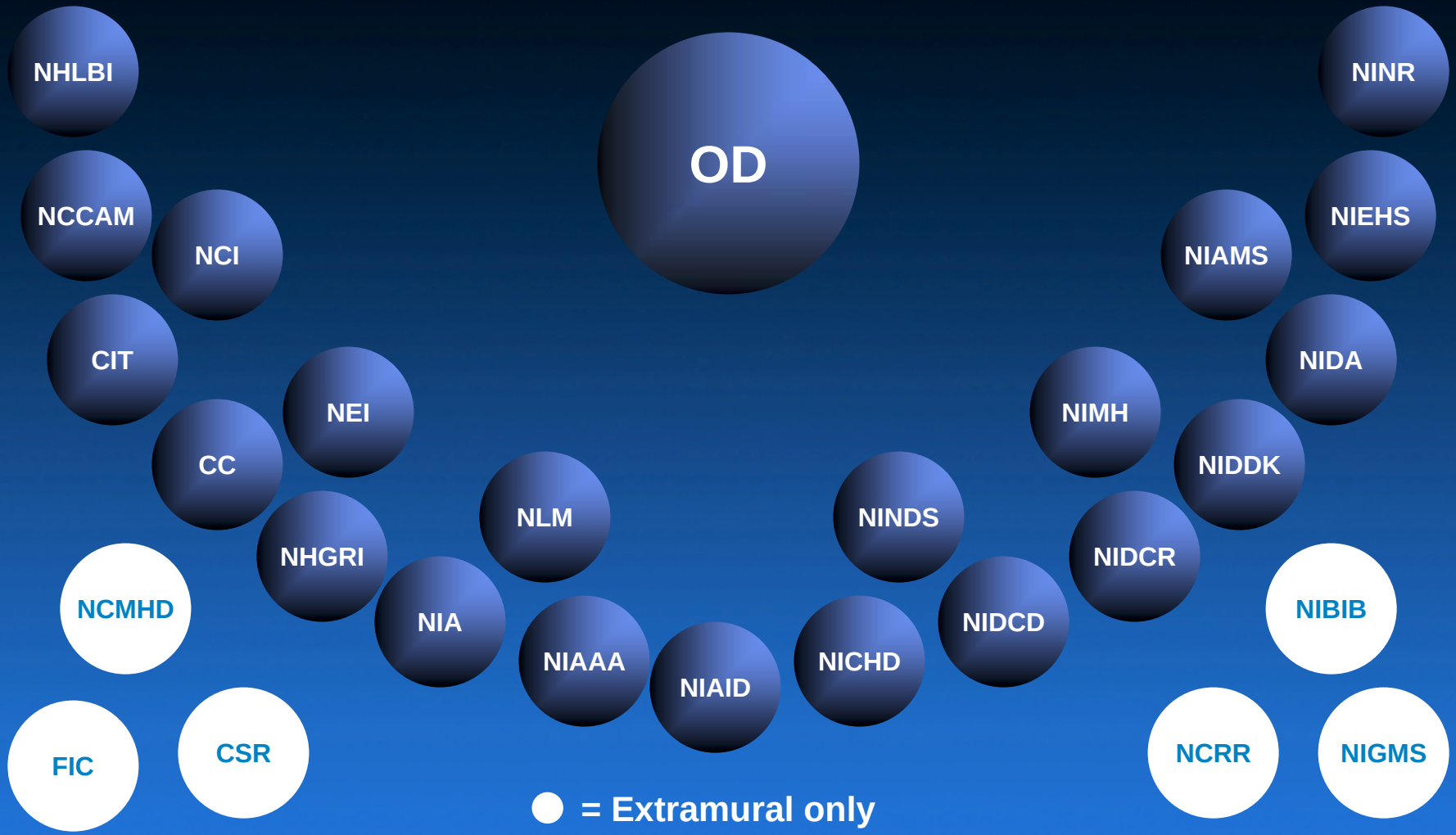

Frederick, MD
Baltimore, MD
Bethesda, MD


National Institutes of Health
Bethesda, MD



The NIH has 75 buildings on 322 acres in Bethesda, Maryland

NIH consists of 27 Institutes and Centers



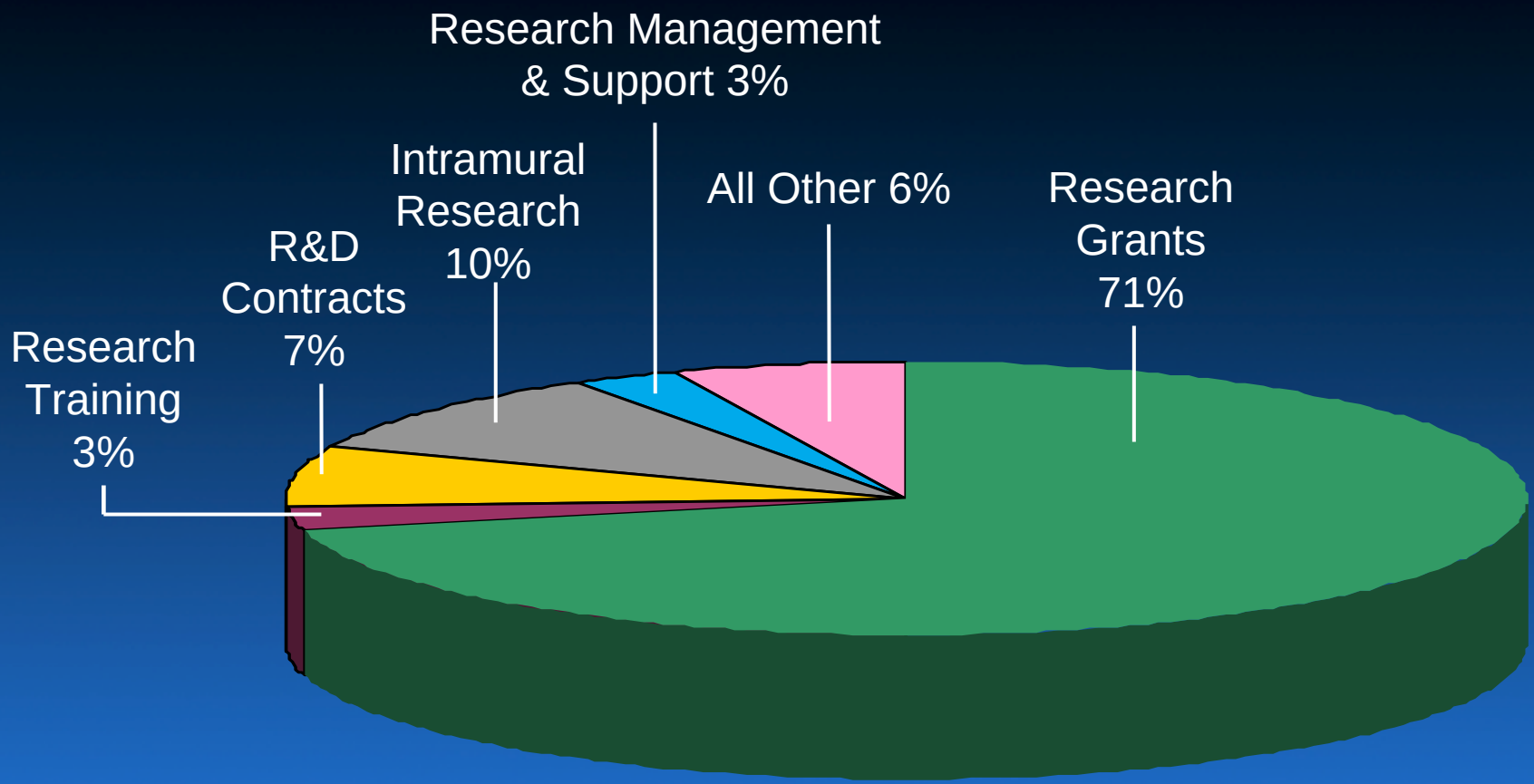
National Institutes of Health

The mission of the NIH is to uncover new knowledge that will lead to better health for everyone by:

- conducting research in its own laboratories (**intramural**)
- providing support for research conducted by scientists in universities, medical schools, hospitals, and other research institutions throughout the country and abroad (**extramural**)
- training research investigators
- fostering the communication of medical information

National Institutes of Health

(FY 2001 $20.3 billion)



Over 80% of NIH funds support extramural research

Warren Grant Magnuson Clinical Center

The world's largest hospital devoted exclusively to clinical research.

- 250 beds
- 7,000 inpatient admissions a year
- 9,750 new patients a year
- 72,600 outpatient visits a year
- 1,200 physicians, dentists, and doctoral-level researchers
- 900 active clinical research protocols

Mark O. Hatfield
Clinical Research Center – April 2002

Opening 2004

Mark O. Hatfield Clinical Research Center

- **220 Beds**
- **77 Day Hospital Stations** – for patients who require a more intensive setting than an outpatient clinic, but do not require admission to the hospital
- **Flexibility** – lab space and patient care areas can be easily interchanged depending on future needs

The Louis Stokes Laboratories Building 50

- 253 lab modules arranged in neighborhood clusters to facilitate scientific collaboration
- Research conducted in this facility includes structural and cell biology and microbiology involving investigators from 8 institutes
- Basement houses a state-of-the-art vivarium, big magnets used in NMR structural studies, and a vibration-free slab with high-end electron microscopes for use in cryomicroscopy and electron crystallography

Also, coming in 2005, Porter Neuroscience Research Center

How many researchers are at NIH?

1,000	summer students (high school, college, graduate, and medical)
230	postbaccalaureate trainees
93	medical students
160	graduate students
3,300	postdoctoral and clinical fellows
287	tenure-track investigators
919	senior investigators

(2001 data)

How is our research structured?

1,200 intramural research laboratories and clinical branches

2,480 intramural research projects

90 scientific interest groups

(2001 data)

Nobel Laureates in the NIH Intramural Program

Marshall W. Nirenberg, Ph.D., NHLBI (1968)
Translated the genetic code of DNA and explained how it functions in the production of protein in the cell

Julius Axelrod, Ph.D., NIMH (1970)
Discovered the regulation of neurotransmitters, chemicals involved in nerve cell communication, leading to therapies for disorders like depression

Christian B. Anfinsen, Ph.D., NIAMS (1972)
Determined the relationship between the sequence of amino acids in proteins and their 3D structure

Nobel Laureates in the NIH Intramural Program (Cont'd)

D. Carleton Gajdusek, M.D., NINDS (1976)
Identified so-called slow viruses (now known as prions), which cause neurodegenerative diseases, and their mode of transmission

Martin Rodbell, Ph.D., NIEHS (1994)
Discovered "G" proteins which trigger a cell's response to outside signals, involved in normal activities and in diseases like cancer and cholera

Distinguished scientists who trained at NIH

Joseph L. Goldstein, M.D. and
Michael S. Brown, M.D.
Paul J. Thomas Professors of Medicine and Gentetics, University of Texas Health Science Center at Dallas, *Nobel Laureates*

Philip Leder, M.D.
John Emory Andrus Professor of Genetics at Harvard Medical School

Harold E. Varmus, M.D.
Director, Memorial Sloan-Kettering Cancer Center, *Nobel Laureate*, and former director of the NIH

NIH scientists in the news - 2001/02

Harvey J. Alter, M.D.
Lasker Award recipient. Recognized for his ongoing studies to uncover the causes and reduce the risks of transfusion-associated hepatitis

Francis S. Collins, M.D., Ph.D.
Contributions to the success of the Human Genome Project

Anthony S. Fauci, M.D.
Award-winning research, recognized for his seminal research into AIDS and other immune system diseases

NIH research advances 2001

Altered catechol-o-methyltransferase (COMT) gene disrupts dopamine function in prefrontal cortex and increases risk of schizophrenia

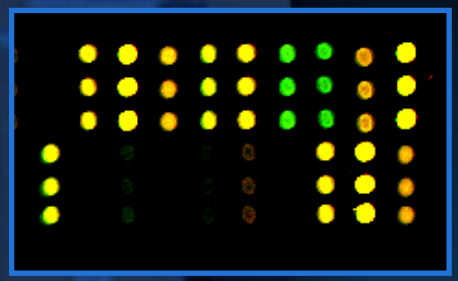
Detection of a new gene for familial prostate cancer

Development of a new diagnostic test for ovarian cancer using serum proteomics

Development of a new vaccine to protect against cervical cancer

Demonstrated that an immunotoxin developed using recombinant DNA technology induced complete remission in hairy-cell leukemia.

Research in the 21st Century



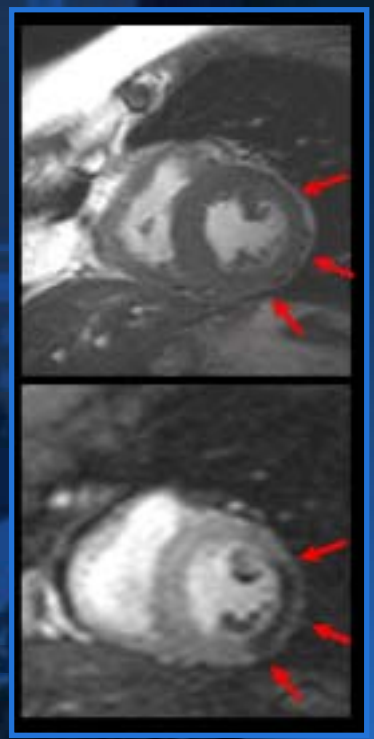
Genomics – With a greater understanding of the molecular basis of diseases, the possibility of developing successful prevention and treatment strategies is greatly enhanced

Research in the 21st Century (Cont'd)

Advanced Technologies – New approaches to studying protein structure and function will bring great insights into the study of diseases and the design of new drugs

Research in the 21st Century

(Cont'd)



Disease Prevention, Diagnosis, and Treatment- New age of medical research with advanced molecular and imaging techniques provides unprecedented opportunities to design new ways to prevent, diagnose, and treat many diseases and conditions

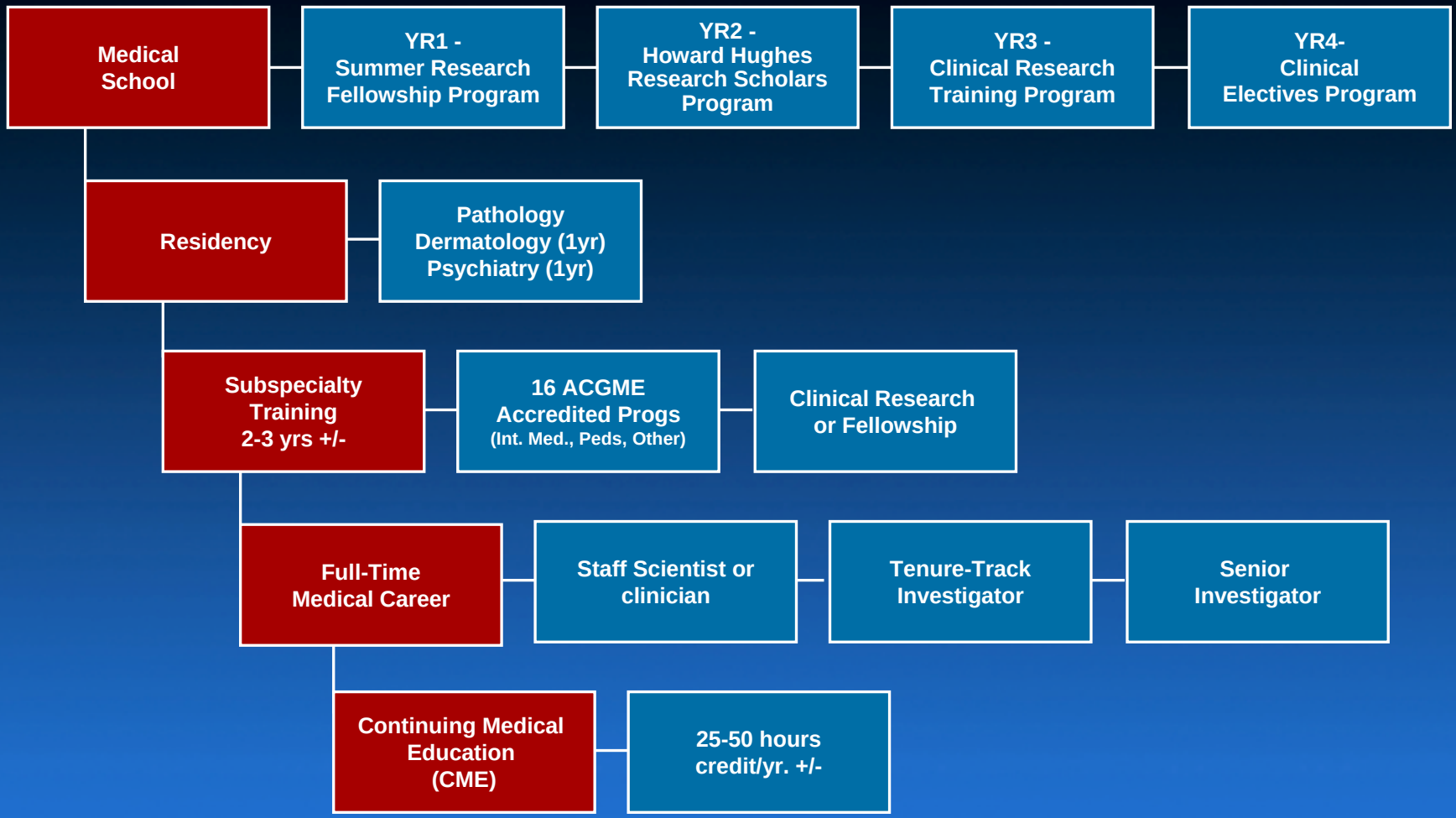
Research in the 21st Century(Cont'd)

Training and Collaboration – Putting together the "big picture" of how the body does things will involve mathematicians, physicists, engineers, chemists, psychologists, computer scientists and experts in genomics to work on these medical problems

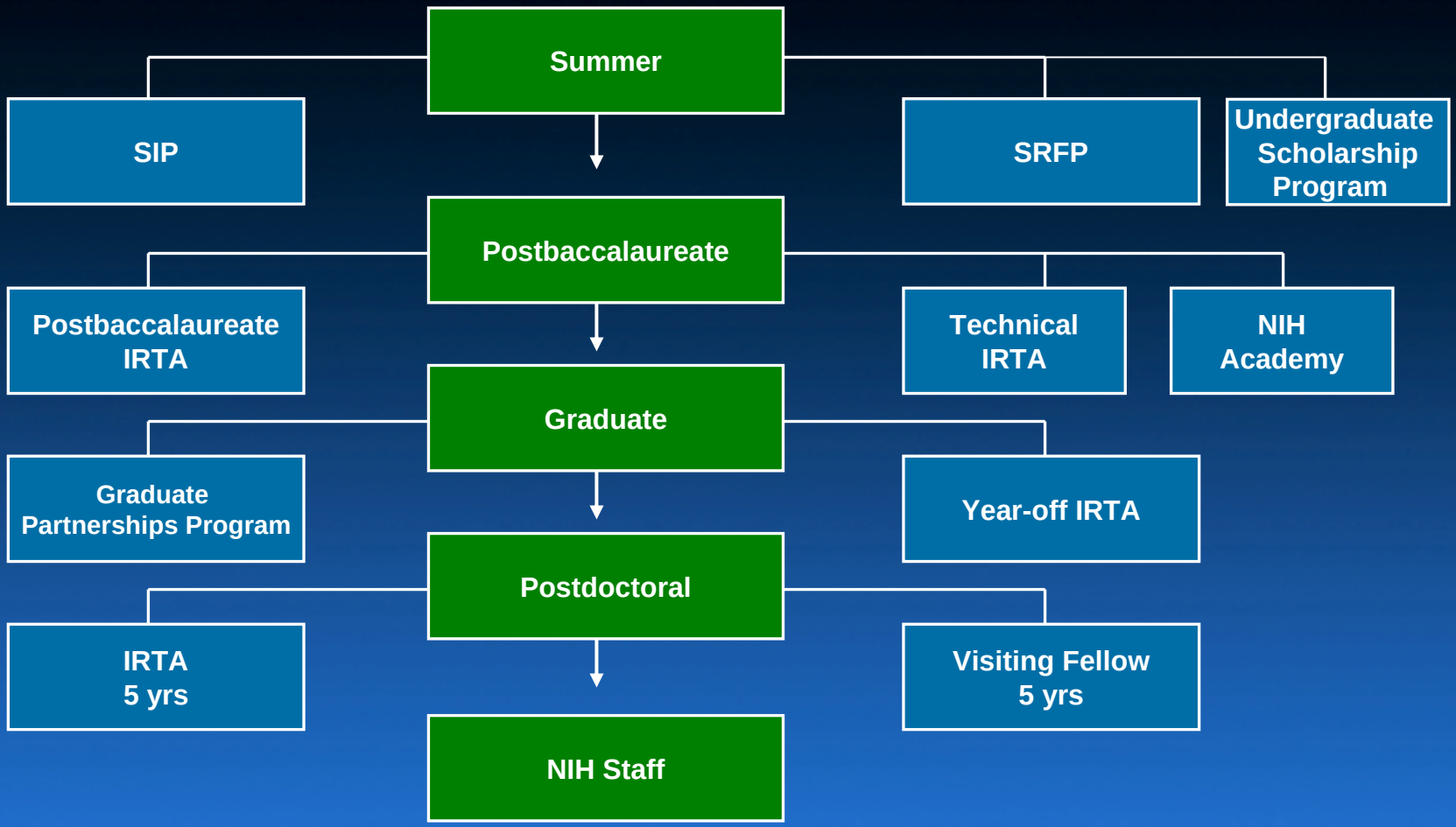
Health Disparities – Ways to eliminate health disparities affecting minority populations and the medically underserved will be sought

Health Education and Outreach – People will be informed about the latest advances in medical research so they can take the best steps to improve their health, avoid diseases, or seek treatment

Intramural Medical Education



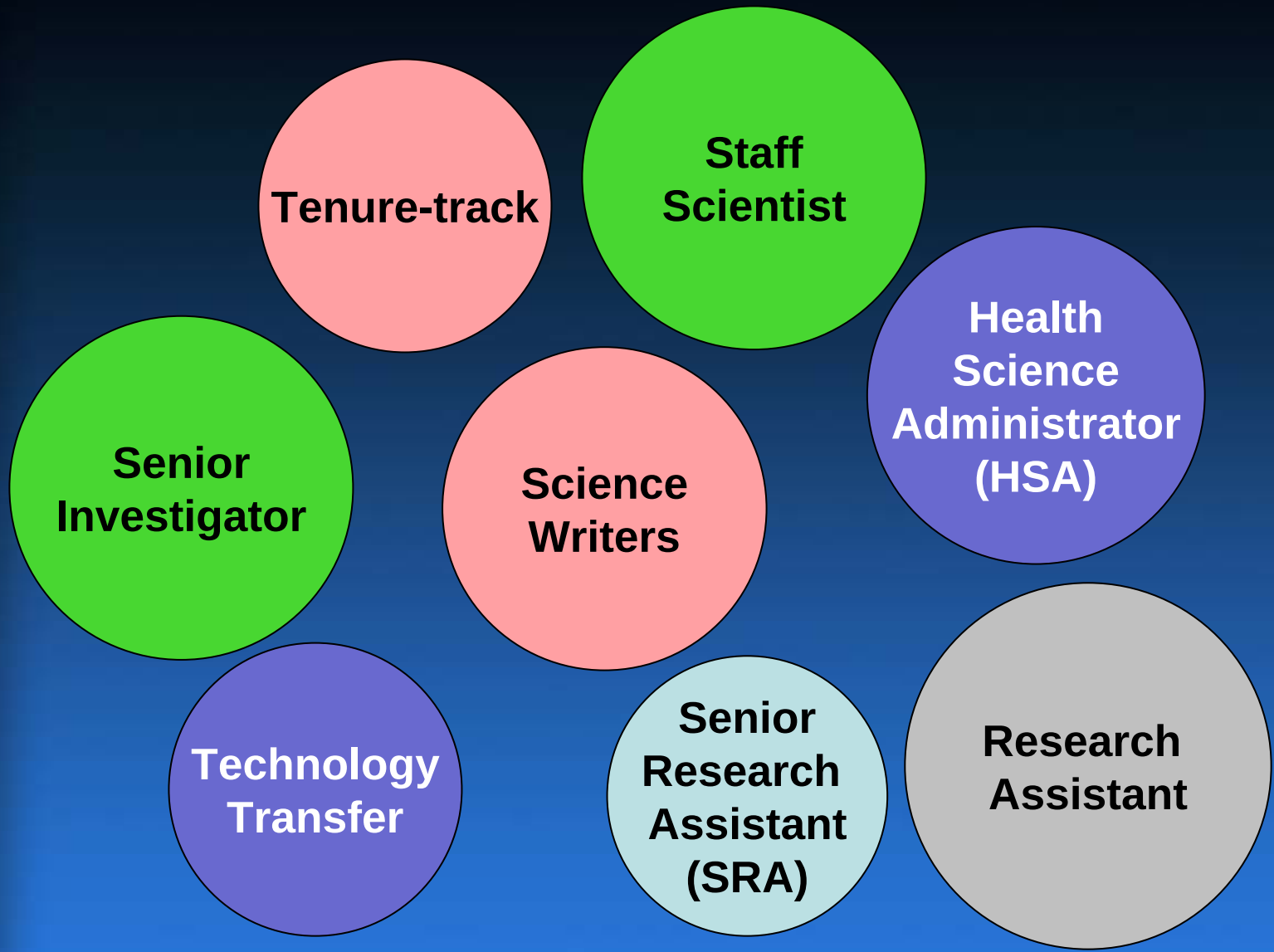
Intramural Training Programs



Types of Research NIH Conducts

Biochemistry, Bioengineering, Bioinformatics, Biostatistics, Biophysics, Cell Biology, Chemistry, Computing, Developmental Biology, Environmental Biology, Epidemiology, Genetics, Histology/Pathology, Imaging, Immunology, Microbiology/Virology, Molecular Biology, Pharmacology, Physiology, Proteomics,Structural Biology, Toxicology, Veterinary Research

Job Opportunities at the NIH



Web Sites

Intramural

http://www.training.nih.gov

Extramural

http://grants.nih.gov/training/extramural.htm

www.nih.gov